Demography
DOI 10.1007/s13524-015-0373-6

Age at Migration, Language Proficiency, and Socioeconomic Outcomes: Evidence From Australia

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Abstract This study estimates the causal effects of language proficiency on the economic and social integration of Australian immigrants. Identifying the effects of languages on socioeconomic outcomes is inherently difficult owing to the endogeneity of language skills. Using the phenomenon that younger children learn languages more easily than older children, we construct an instrumental variable for language proficiency. To achieve this, we consider the age at arrival of immigrants who came as children from Anglophone and non-Anglophone countries. We find a significant positive effect of English proficiency on wages and promotions among adults who immigrated to Australia as children. Higher levels of English proficiency are associated with increased risk-taking, more smoking, and more exercise for men, but have considerable health benefits for women. English language proficiency has a significant influence on partner choice and a number of social outcomes, as well as on children's outcomes, including their levels of academic achievement. The results are robust to alternative specifications, including accounting for between-sibling differences and alternative measures of English skills.

Keywords Immigration · English proficiency · Socioeconomic outcomes · Instrumental variable · Australia

Introduction

Language proficiency affects both the economic and social outcomes of immigrants (Borjas 1990; Chiswick and Miller 1995). An improvement in immigrants' ability to speak the host country language enables them to communicate with their colleagues and customers more effectively, thus increasing their productivity and opening up new

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Published online: 07 March 2015

opportunities as their fluency improves. Language skills are also necessary to enable immigrants to adjust to cultural differences. Chen (2013) found that language skills could determine whether individuals save more, retire with more wealth, smoke less, practice safer sex, and are less likely to be obese. Bleakley and Chin (2004, 2008, 2010) found that the language skills of immigrants in the United States have a significant influence on their wages, residential location, marriage, fertility, and children's education.

In this article, we estimate the causal effects of English language proficiency on a range of economic and social outcomes using a nationally representative household-based panel study in Australia covering the period 2001–2011. To the best of our knowledge, this is the first article to examine the causal effects of English skills on labor market and social outcomes in Australia. We also examine outcomes that have not been investigated by any previous studies in the context of any other countries. Our study is the first to demonstrate that language can affect the individual's health and satisfaction with partners and jobs. We also examine the effects of parental languages on a range of children's outcomes, such as test scores, club memberships, socialization, and their perceived importance of sports and hobbies.

Although Australia has a history of accepting immigrants from non-English-speaking countries, particularly those in Eastern Europe, recent years have seen an increased influx of immigrants from non-English-speaking countries in Africa as well as South and Eastern Asia. In the Australian population today, approximately one in four were born overseas, of which more than one-half came from non-English-speaking countries. As of this writing, nearly one-fifth of Australia's population speaks a language other than English at home.

Since the 1970s, Australia has been operating an immigration policy based on an explicit set of criteria targeting age, skills, and language proficiency. However, the policies that determine the selection process have evolved to favor those who are young, are more qualified and experienced in their occupations, are more fluent in English, and possess the skills that are in demand among employers. Skilled migrants formed about 20 % of the total immigration intake during the early 1990s, rising to about 65 % by 2010. In contrast, family (re)unification flows constitute a significant component of immigrant flows in the United States. Antecol et al. (2003) compared the migration policies of Australia, Canada, and the United States and concluded that the attributes of migrants who are entering under skilled migration differ significantly from those of migrants who are entering under family reunification programs. They also found that skilled migrants perform better than other categories of migrants in the labor market in Australia primarily because of their superior characteristics in terms of age, qualification, and language. Jasso and Rosenzweig (2008) compared immigration policies in Australia and the United States, and their findings suggested that differences in the composition of migration arise because the two countries assign different percentages of the available migration places to economic migration and family reunification. The United States receives a much larger share of immigrants from Latin America, especially from Mexico. Australia, on the other hand, now receives a larger share of immigrants from Asia, primarily China and India. However, unlike the United States, Australia's immigrants are assessed based on their age, English skills, and occupation. Antecol et al. (2003) argued that the comparatively low overall skill level of U.S. immigrants is attributable to the geographic and historical ties to Mexico,

not to a lesser importance of skill-based admissions in the United States than in Australia. Clarke and Skuterud (2014) found that the selective point systems of Australia and Canada resulted in higher immigrant skill levels than in the United States. Therefore, the findings from studies in the context of Australia could contribute significantly to our understanding of the effects of languages, given its greater emphasis on attracting skilled migrants to the migrant-receiving countries.

However, identifying the effects of languages on socioeconomic outcomes is inherently difficult because of the endogeneity of language skills. Language abilities are often correlated with other attributes that cannot be measured, such as innate ability, the culture of the country of origin, or the motivation to learn a new language. We use an instrumental variable (IV) strategy based on the age at arrival of immigrants who came to Australia as children from English-speaking and non-English-speaking countries to identify the causal effects of languages. In adopting the IV, we follow Lenneberg (1967), who proposed that there was a critical period for language acquisition. According to Lenneberg, if a person was exposed to a language within that critical period, a native level of proficiency in that language is almost certain. Immigrants from English-speaking countries are used to control for other variables in order to partial out the effect of age at arrival on immigrants' socioeconomic outcomes.[1]

We go a step further, checking the robustness of the IV estimates by adding sibling fixed effects. This allows us to estimate the varying effects among siblings who migrated with their parents as children, but who did so at different ages. Overall, our results suggest a significant positive effect of English proficiency on wages (especially for men) and promotions (especially for women). English proficiency has health benefits for women: women with better English skills report higher subjective health levels, fewer chronic conditions, and higher values of objective health. These women also report drinking more. Men with greater English skills take more risk, and smoke and exercise more. A proficiency in English decreases male-dominant gender views, increases the age at first marriage, and affects partner choice: specifically, it improves the spouse's English and subjective health, and increases the amount they drink. English language proficiency also increases the likelihood of the spouse being Australian and belonging to a different country of birth and ancestry.

A parent's proficiency in English has a positive effect on the children's proficiency in English, high school achievements, occupational prestige, and social capital, although it has a negative effect on children's urban residency and homeownership. Fathers' proficiency in English has a positive influence on how much their children value hobbies and sports, but it reduces the importance their children place on having their own children at younger ages. Children whose mothers speak good English have higher socialization index values (i.e., are more social) and are more satisfied with their relationship with their parents. Mothers with better English skills also increase the likelihood of their children being members of a club and being a supervisor at work. We also observe that a lack of proficiency in English is reflected strongly in the length (in minutes) of the survey interview and in the interviewer's assessment of the respondent's understanding of the survey questions.

[1] Bleakley and Chin (2004, 2008, 2010) considered a similar IV based on the critical period and age at arrival of children from non-English-speaking countries.

Related Studies

A number of studies have examined the relationship between language and earnings. In a study that is closest to our own work, Bleakley and Chin (2004) used 1990 U.S. Census data. They found that children who migrated when they were young have an advantage over their older counterparts in learning English and that language acquisition influences immigrants' incomes. Dustmann and Fabbri (2003) found that those with a tertiary education are actually more proficient in English. Chiswick and Miller (1995) found that proficiency in the destination language is an important determinant of immigrants' earnings in Australia, Canada, Israel, Germany, and the United States. Dustmann and van Soest (2002) argued that the measurement error in language proficiency is an important factor that needs to be taken into account. The IV estimate of the return to good German language ability is almost triple their ordinary least squares (OLS) estimates (5 %).

Bleakley and Chin (2010) examined the effects of English proficiency on marriage, fertility, and residential location. Their results suggested that English proficiency is linked to social assimilation and increases the likelihood of divorce among immigrants. Stevens and Swicegood (1987) found that English proficiency increases the likelihood of intermarriage, and Meng and Gregory (2005) found a positive correlation between intermarriage and increased earnings for immigrants in Australia. Swicegood et al. (1988) found that increased language proficiency leads to lower fertility rates in Mexican Americans. Dustmann and Fabbri (2003) argued that various social outcomes, such as the probability of being married and the number and gender of any children in the household, could affect the language proficiency. Funkhouser and Ramos (1993) found that immigrants with good language skills are more likely to live outside ethnic enclaves. According to Bleakley and Chin (2010), immigrants from both English-speaking and non-English-speaking countries were more likely to live in social enclaves as their age at arrival in the United States increased.

Immigrants' poor language skills may affect the fluency of second-generation immigrants; in turn, poor fluency may have an adverse effect on their labor market performance. Thus, improving the language fluency of first-generation immigrants may have not only an immediate impact but also a long-term impact by improving the labor market performances of second-generation immigrants. Casey and Dustmann (2008) demonstrated a significant and sizeable association between parental language fluency and that of their children. Bleakley and Chin (2008) found that parental proficiency in English had a significant positive influence on their children's English-speaking ability, preschool attendance, and the attainment of an age-appropriate grade. Research in child language development has suggested that children's language and educational outcomes improve when parents read to their children, use larger vocabularies, or discuss more complex ideas (Farkas and Beron 2004).

English language proficiency has previously been associated with health-related behaviors, disease prevalence, and the receipt of health care services. English proficiency could also affect health outcomes among immigrants given that language skills could influence health services usage (Kang et al. 2010); the doctor–patient relationship (Ferguson and Candib 2002); and other health-seeking behaviors and lifestyle choices, such as involvement in sports and smoking, drinking, and eating habits. A limited proficiency in English can result in significant gaps in individuals' access to health care

(Hu and Covell 1986; Weinick and Krauss 2000); a decreased likelihood of having a usual source of care (Kirkman-Liff and Mondragon 1991; Weinick and Krauss 2000); an increased probability of receiving unnecessary diagnostic tests (Hampers et al. 1999); more serious adverse outcomes from medical errors (Divi et al. 2007); and more drug-related complications (Gandhi et al. 2000). DeWalt et al. (2004) found a significant relationship between literacy and several health outcomes, and Schachter et al. (2012) found a significant association between language proficiency and health status among American immigrants.

DuBard and Gizlice (2008) found that Spanish-speaking Hispanics in the United States have far worse health status and access to care than English-speaking Hispanics. DuBard et al. (2006) found that Spanish-speaking Hispanics suffering acute heart attacks or strokes have longer delay times before hospital arrival and are therefore less likely to benefit from time-dependent reperfusion therapies. A report by the U.S. Institute of Medicine (2010) documented that members of racial and ethnic minority groups receive poorer quality care than their white counterparts. Hart and Risley (1995) found that African American children have worse language skills and shorter mean lengths of utterances than children who are predominantly European American. However, African Americans also have lower socioeconomic status (SES). Therefore, identifying the causal relationships between children's outcomes and their SES and race is difficult because of the usual confounding of these variables in the societies in which most of the research has been conducted (Pungello et al. 2009). To the best of our knowledge, no study has established a causal relationship between English skills and health outcomes.

Data and Descriptive Statistics

The article uses data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, including rounds 1 to 11. The HILDA data are collected annually; the panel members were followed during the period 2001–2011, and all adults (aged over 15) from each of the households were interviewed annually. Each wave collects extensive information regarding individual- and household-level economic factors relating to economic well-being, health status, labor market dynamics, and family dynamics. For this study, we use the sample of people who were born overseas and migrated to Australia as children aged 0 to 17 (inclusive).

The data provide the exact year of arrival for each immigrant in each wave, in addition to the year of birth and country of birth.[2] Age at arrival is calculated as the year of arrival minus the year of birth for each immigrant. Following Bleakley and Chin (2004) and the CIA World Factbook,[3] we split countries into the following three categories: (1) English-speaking (ES) countries where English is the only official language (14,813 observations); (2) countries where English is an official language among multiple official languages (4,197 observations); and (3) non-English-speaking

[2] One hundred and twenty-eight countries of origin are classified according to the Standard Australian Classification of Countries (SACC), 1998 (http://www.abs.gov.au/AUSSTATS/abs@.nsf/0/1837ADE79569F330CA2572680017FE07?opendocument).

[3] The CIA World Factbook is available online (https://www.cia.gov/library/publications/the-world-factbook/).

(NES) countries where there is only one official language, and it is not English (13,232 observations). Following Bleakley and Chin (2004), we use countries in the first and third categories only and exclude the second category of countries from our main analysis.

HILDA also includes information on whether English was the first language learned as a child, with 16,640 observations for a "yes" response and 15,585 observations for a "no" response. All members of the household (regardless of their country of birth) were asked about English language proficiency if a language other than English was also spoken at home. In each wave, from 1 to 11, anyone speaking a language other than English at home is asked, "Would you say you speak English . . . ?", and the answer is coded as follows: 0 = "not at all"; 1 = "not well"; 2 = "well"; and 3 = "very well."

Table 1 presents the descriptive statistics for the regression sample (for labor market outcomes), including immigrants who have been living in Australia for 16 to 30 years, are aged 25–38, and arrived before the age of 18. Among Australian immigrants in the sample, 45 % were born in a country where English is not the main spoken language. Further, 75 % of those who arrived before the age of 18 came to Australia when they were younger than 12 years; 67 % of those who arrived before age 15 came to Australia when they were younger than 10 years. The average age at migration is 8.18 for immigrants who came to Australia when they were younger than 18 and 7.04 for those who arrived when they were younger than 15. English was not the first language spoken as a child for approximately 47 % of all immigrants.

Next, the means are reported for child immigrants, including both those who arrived in Australia young (0–11) or older (12–18) and for immigrants from non-English-speaking (NES) and English-speaking (ES) countries separately. Approximately 50 % of all immigrants are male. There does not appear to be any gender difference across cohorts among immigrants from NES countries, although males generally arrived at younger ages among immigrants from ES countries. The average age for all immigrants in the sample is around 31.3 years. For immigrants from NES countries, reported English ability is higher for those who arrived at a younger age. Among immigrants from NES countries, the number of years of education seems to be slightly higher for the younger arrivers, whereas schooling does not appear to differ across younger and older arrivers for immigrants from ES countries. In terms of labor market outcomes, log wages and promotion probabilities (during Waves 1–11) are higher for the younger than for the older arrivers among the immigrants from NES countries, but the perceived probability of losing a job is lower; however, these numbers are similar for younger and older arrivers among immigrants from ES countries.

Empirical Strategy

To identify the causal effect of English language skills on economic and social outcomes, we consider the following regression model:

$$Y_{ija} = \alpha + \beta Eng_{ija} + \theta \mathbf{X}_{ija} + \delta A_a + \gamma N_j + \varepsilon_{ija}, \quad (1)$$

where Y_{ija} is the outcome of interest for individual i born in country j arriving in Australia at age a. Eng_{ija} is a measure of English language skills. It is a categorical

Table 1 Descriptive statistics

Variable	All Immigrants				NES Country of Birth		ES Country of Birth	
	Mean	SD	Min.	Max.	Age at Arrival (0–11)	Age at Arrival (12–17)	Age at Arrival (0–11)	Age at Arrival (12–17)
Non-English-Speaking Country of Birth	0.453	0.498	0	1				
Arrived Young (0–11 years)	0.748	0.459	0	1				
Arrived Young (0–9 years)	0.667	0.471	0	1				
Age at Migration (0–17 years)	8.179	5.247	0	17				
Age at Migration (0–14 years)	7.036	4.495	0	14				
First Language Not English	0.469	0.500	0	1				
English Ability	2.922	0.308	0	3	2.912	2.545		
Gender (male = 1)	0.498	0.500	0	1	0.452	0.479	0.549	0.402
Age	31.329	3.811	25	38	29.990	34.276	30.841	34.361
Years of Schooling	13.731	2.495	10	20	14.228	13.563	13.415	13.170
ln Hourly Wages (all jobs)	7.580	0.550	0.653	11.048	7.651	7.501	7.546	7.552
Promoted	0.119	0.323	0	1	0.132	0.038	0.123	0.128
Probability of Losing Job	11.174	20.121	0	100	11.745	13.532	10.185	10.753

Notes: Table includes regression sample for labor market outcomes (age at arrival 0–17, living in Australia between 16 and 30 years, aged 25–38).

variable on a scale of 0–3, with 3 indicating the highest English proficiency (native). N_j is a dummy variable for being born in an NES country; A_a is a dummy variable for arriving young (in line with Bleakley and Chin (2004), this age is chosen to be 11 years or younger); and $\mathbf{X}_{ija}$ is a vector of controls for individuals (age, gender, schooling, country of birth dummy variables). We consider regression with and without controlling for schooling because schooling is highly correlated with language skills.

The error term ε_{ija} captures the effects of any omitted or unobservable variables. Various unobservable characteristics—such as intelligence; ability; and cultural factors, such as motivation—could influence an individual's language abilities and outcomes of interest. The endogeneity problem arises because these characteristics are correlated not only with the outcomes of interest but also with language skills. It is reasonable to assume that an individual's level of intelligence and motivation will have a significant impact on their acquisition of a second language. This causes correlations between the explanatory variable of language skills, *Eng*, and the error term ε_{ija}. In this situation, the OLS estimates are biased, and any inferences made regarding the impact of language skills are inaccurate.

To overcome this problem, we adopt an IV approach. Specifically, we argue that younger children acquire language skills more easily than older children and adults. Because those who arrive in Australia at an early age are exposed to the English language at an earlier stage of their life, they have an advantage in learning English. However, younger child immigrants could differ from their older counterparts in many ways other than English proficiency. It is plausible to argue that younger immigrants will be able to adjust better to the Australian culture, values, and institutions, which would lead to differences in outcomes between younger and older immigrants that have nothing to do with English proficiency. Therefore, comparing young arrivers with their older counterparts could simply reflect the age-at-arrival effect. To control for these non-language-related age-at-arrival effects, we take advantage of the fact that those arriving from NES countries are also experiencing their first exposure to native English speakers. Immigrants arriving from ES countries have been exposed to English earlier, and hence their English proficiency is not affected by the age at which they arrived in the country. As such, by using the immigrants from ES nations as a control, we can control for the other factors faced by immigrants upon arrival. We consider both younger and older child immigrants from NES countries and compare them with their counterparts from ES countries to control for all other determinants affecting language proficiency, earnings, and other outcomes.

In Eq. (1), age at arrival is a binary variable equal to 1 if the individual arrived at age 11 or younger. The instrument is an interaction between age at arrival and country of birth. Any differences in outcomes between the younger and older cohorts of child immigrants from NES countries that are over and above the difference from ES countries can plausibly be attributed to language. Incorporating immigrants from ES countries into the analysis enables us to remove the non-language effects of age at arrival because upon arrival in Australia, immigrants from ES countries encounter everything that immigrants from NES countries encounter, except a new language.

The first-stage regression relates the endogenous regressor English language skill, Eng_{ija}, to the instrument:

$$Eng_{ija} = \alpha + \sigma(A_a \times N_j) + A_a + n_j + \theta \mathbf{X}_{ija} + \upsilon_{ija}. \quad (2)$$

Here, A_a is the "arrived young" dummy variable, and n_j is a full set of country-of-birth dummy variables that control for cross-country differences more precisely than the use of a dummy variable for NES country of origin.[4] For these young immigrants from ES countries, we simply assume that their English ability is native-like ($Eng = 3$).

We focus on immigrants who arrived at ages 0–17 and currently live in Australia. For these child immigrants, their age at arrival is determined by their parents or relatives. Age at arrival is a key factor in determining their subsequent English proficiency. Our data set includes the exact year in which each immigrant arrived in Australia to live, which we use to calculate the age at arrival. An additional sample restriction when examining labor market outcomes is that we consider immigrants who have been living in Australia for between 16 and 30 years and are currently aged 25–38. This restriction ensures that migrants are not newcomers but share a similar wage profile. When examining the social, partner, health, and children's outcomes, we consider migrants who have been living in Australia for between 11 and 55 years.[5] We also adopt the same methodology to identify the effects of immigrant parents' levels of proficiency in English on the English proficiency and other outcomes of their Australian-born children. In this case, Y is the outcome of interest for the children (such as their English proficiency and schooling outcome), and Eng_{ija} is a measure of parental English language skills.

Empirical Results

Age at Arrival and English Proficiency

The association between age at arrival and English proficiency is presented graphically in Fig. 1, which plots the data for three-year intervals, given the smaller numbers of observations for each age-year. In line with the previous findings on language acquisition, immigrants who start to learn English at an earlier age reach higher levels of English ability than those who start later. The lines for both groups are higher than 2.8 before the age of 11, falling sharply thereafter.

Table 2 presents the first-stage results: namely, the effects of age at migration on ES abilities. Column 1 indicates that immigrants who arrived from a NES country of birth at or before age 11 have better English skills than their older counterparts who came between the ages of 11 and 18. Column 7 replicates this using the interaction between young arrivals and migrants whose first language was not English (FL not English).

[4] We also consider using a parameterization that admits a degradation in language-learning ability that starts at age 12 and grows linearly (Bleakley and Chin 2004). Because the results are qualitatively similar (but less significant) and our sample size is not really sufficient (such a parameterization requires a large number of observations for each age group), we present results using the arrived-young dummy variable in most specifications.

[5] The larger age window is the result of identifying the relationship between partners or between children and their parents.

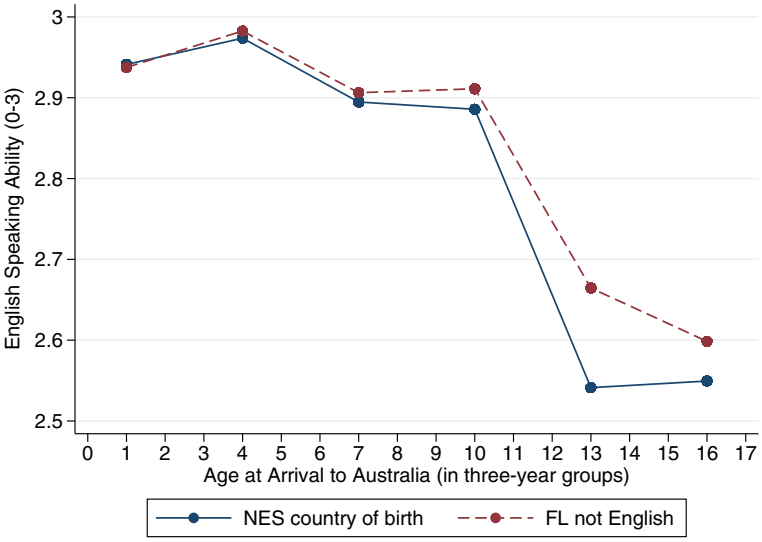

Fig. 1 Age at arrival and English language proficiency. The sample consists of age at arrival 0–17, living in Australia 11–55 years, and currently aged 25–55

The coefficient on the interaction term is smaller but remains statistically significant. The estimate suggests that younger immigrants whose first language is not English have a 0.283 unit advantage over older arrivers (where English is on a scale of 0–3 units). Columns 2 and 8 estimate the same regressions as in columns 1 and 7, with the exception that the sample is now immigrants who arrived before the age of 15, and the cutoff age is now 9 instead of 11 years old. We find statistically significant coefficients in both cases, but the magnitude of the coefficients becomes smaller. Columns 3–4 and 9–10 present the estimates when age at arrival is treated as a continuous variable. The results confirm the hypothesis that older children who migrate with their parents from NES countries (or whose first language is not English) are likely to learn English less well than their younger counterparts. The binary instrument is also significantly positively related to all levels of English language proficiency (columns 5–6 and 11–12). The results suggest that younger arrivers are 27 % more likely to speak English very well, and 11 % more likely to speak English well or very well. Overall, the estimates suggest that the first-stage results are strong and that age at migration is a strong predictor of subsequent English abilities for Australian immigrants.

English Proficiency and Labor Market Outcomes

Table 3 presents the OLS and IV estimates for the sample of immigrants who arrived before the age of 18, have been living in Australia for 16 to 30 years, and are currently aged 25–38. Outcomes of interest are a dummy variable for being employed, log hourly wages, subjective probability for losing a job for the employed (on a scale of 0–100), and a separate set of dummy variables for being promoted and losing job in the survey year.

Panel A presents the OLS estimates. The results indicate a 25 % increase in wages for a one-unit increase in English language skills. Panel B presents the IV estimates for

Table 2 First-stage results: Age at migration and English skills for labor market outcomes

	English Ability Ordinal Measure (0–3) (mean = 2.92)				Speaks English Very Well (mean = 0.98)	Speaks English Well or Very Well (mean = 0.93)	English Ability Ordinal Measure (0–3) (mean = 2.92)				Speaks English Very Well (mean = 0.98)	Speaks English Well or Very Well (mean = 0.93)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Arrived Young × NES Country of Birth	0.367**	0.208†			0.262**	0.106†						
	(3.82)	(2.26)			(4.13)	(2.40)						
Arrived Young (0–11 years)	–0.0024				–0.0005	–0.002	0.0061				0.0081	–0.002
	(0.30)				(0.08)	(0.60)	(0.43)				(0.60)	(0.67)
NES Country of Birth	–0.456**	–0.294*	–0.1348†	–0.1498	–0.3500**	–0.106†						
	(4.49)	(2.89)	(2.11)	(1.50)	(5.10)	(2.43)						
Arrived Young (0–9 years)		–0.007						–0.0068				
		(0.82)						(0.87)				
FL Not English							–0.356**	–0.226*	–0.122†	–0.109	–0.284**	–0.0714†
							(4.07)	(2.58)	(2.33)	(1.38)	(4.61)	(2.13)
Arrived Young × FL Not English							0.283**	0.153†			0.212**	0.0712†
							(3.62)	(2.09)			(3.95)	(2.09)
Age at Migration (0–17 years)			0.00012						–0.0009			
			(0.12)						(0.61)			
Age at Migration (0–14 years)				0.0003						0.0004		
				(0.34)						(0.41)		
Age at Migration × NES Country of Birth			–0.0367**	–0.0389†								
			(3.90)	(2.37)								
Age at Migration × FL Not English									–0.03068**	–0.02936†		
									(4.05)	(2.19)		

Table 2 (continued)

	English Ability Ordinal Measure (0–3) (mean = 2.92)				Speaks English Very Well (mean = 0.98)	Speaks English Well or Very Well (mean = 0.93)	English Ability Ordinal Measure (0–3) (mean = 2.92)				Speaks English Very Well (mean = 0.98)	Speaks English Well or Very Well (mean = 0.93)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
N	1,644	1,487	1,644	1,487	1,644	1,644	1,818	1 617	1,818	1,617	1,818	1,818
Adjusted R^2	0.225	0.143	0.206	0.178	0.220	0.095	0.179	0.105	0.172	0.131	0.177	0.061

Notes: Each regression includes a gender dummy variable and age. Standard errors are clustered at the person and country-of-birth levels, and absolute *t* statistics are shown in parentheses.

$^{\dagger}p < .10$; $*p < .05$; $**p < .01$

different samples, both with and without controlling for schooling. The coefficients reflect the effects of English skills on labor market outcomes. The results in column 1 do not suggest any effect of English skills on employment probabilities. Columns 2–4 show that a one-unit increase in English language ability increases the log of wages by around 0.5–1.2, depending on the choice of sample and the cutoff of wages. Although the size of the coefficient indicates a large positive effect of returns on English language proficiency, Fig. 1 suggests that the average English language proficiency varies between 2.3 and 3 (on a scale of 0–3), and mean log wages are around 7.58. Thus, assuming linearity in returns, if one moves from the average lowest English background in our sample (2.3) to a perfect English background (3), the results indicate an increase in wages of about 35 % (for the coefficient corresponding to a log wage increase of about 0.5). Similarly, we find that the average English language difference between the younger and older cohorts is about 0.37 units. This translates into about a 15 % wage advantage for younger immigrants relative to their older counterparts attributable to language differences. We obtain similar results when the sample is restricted to individuals who are employed full-time and also when we consider only wages from the main job or control for job tenure. Column 6 shows that better English skills decrease the perceived likelihood of losing a job, and column 7 shows that better English skills increase the likelihood of being promoted.

These results are robust to using alternative measures of English skills, to changing the variable indicating whether the immigrant is from a NES country to whether the first language is English or not, and to adding years of schooling as a control. The coefficient estimates become slightly smaller when we add years of schooling as an additional control, but the difference in magnitude of the coefficients with and without controlling for schooling is not statistically significant.

Discussion

The preceding estimates suggest that English skills have a significant causal effect on wages among Australian immigrants. Overall, these results are in line with those of Bleakley and Chin (2004) and Dustmann and van Soest (2002), who also found that English skills are significantly positively related to wages. However, our results show that estimates with and without controlling for education are similar, suggesting that education is not the mediating factor in Australia, unlike the United States as in Bleakley and Chin (2004). Indeed, English skills do not affect education in Australia when we use years of schooling or dummy variables for each category of education completed. One possible explanation suggested in the literature is that English skills assist in communication with colleagues, customers, and bosses, which will determine productivity.

We provide some new potential explanations in support of our results. First, we find that English skills positively and significantly affect the perceived likelihood of finding a job, and consequently, the reservation wages for the unemployed.[6] The results suggest that migrants with better English skills believe that they have better chances of employment and report preferring jobs with higher wages. Indeed, this is consistent with the findings of Brown and Taylor (2008), who demonstrated that the perceived likelihood of finding a job is associated with both higher reservation wages and higher actual wages (and higher probabilities of

[6] These results are not reported here but are available upon request from the authors.

employment) in the next period in the United Kingdom. Second, it is possible that English skills affect job-search behaviors. Frijters et al. (2005) found that immigrants are as likely to gain employment through informal methods as via verifiable routes, and the probability of success increases with the number of years since migration. Daneshvary et al. (1992) found that the job search methods of immigrants and natives differ, and that these differences result in wage differences. Battu et al. (2011) found important differences in job search methods across ethnic groups in the UK. This finding could suggest that people with better English skills use different resources or channels to find a job than people with worse English skills, which will determine the type of job that the immigrant will obtain. If advertised jobs have better working conditions than those found through factory noticeboards, Centrelink offices, or Job Network,[7] this could also help explain why migrants with better English skills will be earning more and could be a fruitful area for future research.

Comparing OLS and IV Coefficients

We would like to provide some insights into the coefficients obtained using OLS, which are reported in Panel A of Table 3, and compare them with the IV coefficients reported in Panel B of Table 3. English skills are significantly related to wages, promotions, and the perceived risk of job loss (with the expected signs). The OLS estimates in the second row of Table 3, column 3, indicate a 25 % increase in wages for a one-unit increase in English language skills. The corresponding estimates using the IV regression indicate an increase of around 100 %, without controlling for education. Thus, the IV coefficients are much larger than the OLS estimates. The specifications in other rows and restricting samples also find higher IV coefficients. Bleakley and Chin (2004) identified two potential explanations for this finding: differences in the weighting functions underlying the OLS and IV estimates,[8] and measurement error in the language skills measure.[9]

The endogeneity of language skills could be attributable to the exclusion of cultural factors such as motivation, rather than being entirely the result of innate ability. Migrants from NES countries may have higher motivation levels and other cultural characteristics that make them more productive in the labor market than migrants from ES countries. If this is the case, the IV estimates will be higher than OLS estimates. Support for this hypothesis comes from the sibling fixed-effects estimations, which will be discussed in detail in the next section. We find that IV estimates with sibling fixed

[7] The Centrelink delivers a range of government payments and services for retirees, the unemployed, families, carers, parents, and people with disabilities, and provides services at times of major change. The majority of Centrelink's services are the disbursement of social security payments. Job Services Australia (formerly known as the Job Network) is an Australian Government–funded network of organizations that is contracted by the Australian Government to deliver employment services to unemployed job seekers on government income support payments.

[8] The variation in the IV estimate comes from the instrument, whereas the OLS estimate uses all the variation. If the marginal return to language proficiency affected by the instrument differs systematically from that of the population, then the coefficients estimated using OLS and IV will be different. As can be seen in columns 5–6 and 11–12 of Table 2, the binary instrument is significantly positively related to all levels of English language proficiency. However, the highest coefficient is obtained when moving to the "spoken very well" level of English language skills. Thus, IV will give a higher estimate than OLS if the greatest gains from language proficiency come from later steps toward proficiency.

[9] Measurement errors in the language proficiency measure may affect OLS and IV differently.

Table 3 English skills and labor market outcomes: Coefficient of English-speaking ability (0–3)

	Control for Education	Employed (mean = 0.95) (1)	ln Hourly Wage (all jobs) (mean = 7.58) (2)	ln Hourly Wage (full-time employed) (mean = 7.59) (3)	ln Hourly Wage (control for tenure) (mean = 7.58) (4)	ln Hourly Wage (main job) (mean = 7.58) (5)	Probability of Losing Job (mean = 11.17) (6)	Promoted (mean = 0.12) (7)
Panel A: OLS Estimate								
English proficiency		0.0470*	0.253*	0.281**	0.253*	0.244*	–6.116*	0.0882*
		(3.22)	(3.20)	(3.52)	(3.09)	(3.13)	(2.71)	(2.63)
N		1,569	1,372	1,077	1,370	1,371	1,291	1,371
Adjusted R^2		0.135	0.179	0.200	0.179	0.180	0.100	0.077
Panel B: IV Estimates (coefficient of English language corresponding to different set of IVs)								
IV: Arrived young (0–11 years) × NES country of birth (full sample)		–0.0797	1.157**	1.149**	1.213**	1.168**	–12.09	0.518**
		(0.58)	(6.03)	(7.12)	(7.30)	(6.61)	(0.86)	(3.75)
IV: Arrived young (0–11 years) × NES country of birth (full sample)	✓	–0.0581	1.065**	1.060**	1.121**	1.085**	–11.62	0.534**
		(0.42)	(5.01)	(5.91)	(5.92)	(5.15)	(0.80)	(3.77)
IV: Arrived young (0–11 years) × NES country of birth (ln hourly wage > 6.97)		–0.0547	0.792**	0.863**	0.807**	0.815**	–18.20	0.475*
		(0.37)	(3.46)	(4.89)	(3.39)	(4.07)	(1.43)	(2.91)
IV: Arrived young (0–11 years) × NES country of birth (8.21 > ln hourly wage > 6.97)		–9.89e–13	0.523**	0.572**	0.565**	0.556**	–16.76	0.415
		(1.89)	(3.30)	(3.55)	(3.76)	(4.11)	(1.57)	(1.73)
IV: Arrived young (0–11 years) × FL not English		–0.109	1.379**	1.689**	1.418**	1.430**	–29.12	–0.118
		(0.75)	(3.50)	(4.93)	(3.85)	(3.76)	(1.76)	(0.30)
IV: Arrived young (0–11 years) × FL not English	✓	–0.0815	1.466**	1.686**	1.506**	1.520**	–28.94	0.00569
		(0.59)	(3.99)	(4.50)	(4.32)	(4.12)	(1.74)	(0.02)
IV: Max. (0, age at arrival – 11) × NES country of birth		–0.139	1.043**	1.217**	1.136**	1.015*	–4.263	0.650**
		(0.79)	(3.58)	(6.18)	(4.34)	(3.28)	(0.21)	(4.31)
IV: Max. (0, age at arrival – 11) × FL not English		–0.0389	0.721†	0.953**	0.766*	0.671†	7.632	0.370†
		(0.39)	(2.46)	(3.38)	(2.79)	(2.19)	(0.50)	(2.21)

Table 3 (continued)

	Control for Education	Employed (mean = 0.95) (1)	ln Hourly Wage (all jobs) (mean = 7.58) (2)	ln Hourly Wage (full-time employed) (mean = 7.59) (3)	ln Hourly Wage (control for tenure) (mean = 7.58) (4)	ln Hourly Wage (main job) (mean = 7.58) (5)	Probability of Losing Job (mean = 11.17) (6)	Promoted (mean = 0.12) (7)
IV: Arrived young (0–9 years) × NES country of birth		0.253	1.618†	1.203*	1.669†	1.759†	–59.69†	–0.233
		(1.28)	(2.27)	(2.83)	(2.26)	(2.16)	(2.09)	(0.49)
IV: Arrived young (0–9 years) × FL not English		0.322	2.470†	2.196*	2.459†	2.630†	–97.50†	–1.077
		(1.18)	(2.33)	(2.66)	(2.34)	(2.26)	(2.31)	(0.80)
IV: Max. (0, age at arrival −9) × NES country of birth		0.0718	1.045**	0.812**	1.071**	1.088**	–41.48*	0.0871
		(0.76)	(3.76)	(3.70)	(3.71)	(3.80)	(2.71)	(0.43)
IV: Max. (0, age at arrival −9) × FL not English		0.0453	0.947*	0.753*	0.945*	0.921*	–31.10	0.347
		(0.43)	(3.05)	(2.92)	(3.00)	(2.88)	(1.78)	(0.89)

Notes: Each regression includes a gender dummy variable, age, age-at-arrival dummy variables, and dummy variables for country of birth. Employed: 1 if full-time or part-time employed, 0 if unemployed. Probability of losing job: percentage chance of losing a job in the next 12 months (for the employed) on a scale of 0–100. Promoted: "Promoted at work?" was asked in waves 2–10 and coded as follows: 1 = Yes; 0 = No. Standard errors are clustered at the person and country-of-birth levels, and absolute *t* statistics are shown in parentheses.

$^{\dagger}p < .10$; *$p < .05$; **$p < .01$

effects are very close to the estimates found in Table 3 (in terms of the size of the coefficients and the level of significance).

Another explanation could be that endogeniety is due to innate ability, and migrants from NES countries could be more able than migrants from ES countries for our regression sample. Unlike the United States, skilled migration makes up a big proportion of migration visas in Australia, with the majority of them coming from NES countries. To check for this possibility, we carried out simple *t* tests for subjective math skills among the regression sample (age at arrival less than 18 and living in Australia for between 16 and 30 years). The results suggest that migrants from NES countries have greater subjective math skills than migrants from ES countries—a difference that is even more pronounced for the sample members who came before the age of 15.

Comparing Our IV Coefficients With Previous Estimates

Our IV results are larger than those of Bleakley and Chin (2004) and Dustmann and van Soest (2002), who found IV estimates to be two to three times larger than OLS estimates. Bleakley and Chin (2004) found that IV estimates for wages are around 0.45, and the OLS estimates are around 0.25. Our OLS estimates for wages are similar to theirs. When we compare their U.S. sample with our sample, we observe that the mean English ability levels for the older (age at arrival 12–17) and younger (age at arrival 0–11) arrivers are nearly the same in the two data sets (2.55 to 2.53 and 2.91 to 2.89). However, the mean (log of) wages is much lower in our data than in the U.S. sample (7.5 vs. 9.6). Thus, the marginal effect at the mean may not differ greatly across these studies. Moreover, our data set consists of migrants from countries that are not included in the U.S. sample. For comparison purposes, when we estimated regressions[10] excluding the restriction of being aged 25–38, we found that the IV estimates were around 0.35–0.50 for log wages, which is close to the findings of Bleakley and Chin (2004).

Ruling Out Reverse-Causality and Other Alternative Explanations

The results reported herein might not reflect the true effects of English language skills for a variety of reasons. For example, immigrants from NES countries could exhibit stronger age-at-arrival effects simply because immigrants from poorer countries face additional barriers to adaptation, with these barriers increasing in severity as a function of age at arrival. To check for this possibility, we estimate the first and second stages using controls for the characteristics of the country of birth instead of using country-of-birth dummy variables. The controls are the infant mortality rate and the per capita gross domestic product (GDP) in the country of birth in the year of birth for each immigrant.[11] Measures of schooling quality (school expenditures and teacher-to-pupil ratios) are available in five-year intervals and are used in the country of birth for each immigrant during the appropriate year-of-birth interval.[12] In these unreported

[10] We reported the results in an earlier working version of this article, which is available upon request.

[11] IMR can be found online (http://www.gapminder.org/documentation/documentation/gapdoc002.pdf), and GDP per capita comes from Maddison (2012).

[12] The schooling quality variables are from Barro and Lee (2001).

estimations, the significance of the first stage remains, and English skills are significant in the IV estimations. However, English skills are statistically less significant (although the sign remains the same) in some cases, which is probably attributable to the small numbers of observations because these variables are missing for some countries.

Another possibility that might bias our estimates is that parents from NES countries may factor their children's ages into the migration decision differently than parents from ES countries. In that case, the age at migration will not be exogenous to the immigrant's characteristics, and various omitted variables (such as parental preferences) will bias our estimates. To assess this, we compare the age-at-arrival distributions of ES and NES immigrants. We find that parents from NES countries are no more likely to migrate when their children are very young than parents from ES countries, despite the fact that older children from NES countries experience the disadvantage of not learning English at younger ages, when it is easier to learn a new language. We also perform simple *t* tests for the mean age at arrival for the immigrant categories. The simple *t* test results show that the age at arrival is indeed higher for immigrants from NES countries, both for people who arrived before the age of 18 and for those who came before the age of 15.

IV Results With Sibling Fixed Effects

The HILDA data set provides detailed information on each adult member living in the household. Thus, we are able to estimate IV regressions for some households, including sibling fixed effects. This estimation method will solve endogeniety issues, not only for country-of-origin (culture) characteristics, but also for parental characteristics. We consider the subsample of migrants who are from NES countries. The identification now comes from between-sibling differences: that is, siblings who came with their parents at different ages. The results shown in Table 4 suggest that age at migration is a very strong predictor of English ability; the coefficients on the younger-arrival dummy variable (in the first and second columns for two different samples) are approximately 0.7.

The second stage of the IV siblings fixed-effect estimates shows that the wage differences between these siblings come from differences in English language abilities that are attributable to differences in age at arrival. Because these siblings come from the same country of origin and have the same parents, the IV sibling fixed-effects analysis differences out these variables, making that the coefficients free of these biases. These estimates provide complementary evidence of the causal effect of English skills on wages. Table 5 shows significant effects for labor market outcomes, having the same signs but slightly smaller sizes of the coefficients.

Falsification Tests

Another way of addressing the validity of the IV estimates that we seek is to provide some falsification tests. If one believes that the IV estimates are picking up some parental or home country characteristics, then we expect any IV regressions for outcomes related to these variables to be insignificant. To test this, we estimated IV regressions for the following outcome variables for which English skills turned out to be insignificant: father white collar at 14, mother white collar at 14, oldest child, father

Table 4 Age at migration and English skills with sibling fixed effects

	Dependent Variable: English Speaking Ability Ordinal Measure (0–3)			
	(1)	(2)	(3)	(4)
Arrived Young (0–11 years)	0.6859**			
	(6.70)			
Arrived Young (0–9 years)		0.7494**		
		(6.83)		
Age at Migration (0–17 years)			–0.0536**	
			(3.51)	
Age at Migration (0–14 years)				–0.0902**
				(4.99)
N	161	142	161	142

Notes: Each regression includes a gender dummy variable, age, and dummy variables for the country of birth and sibling fixed effects. The dependent variable is on a scale of 0–3. Standard errors are clustered at the person and country-of-birth levels, and absolute *t* statistics are shown in parentheses.

**$p < .01$

employed at 14, mother employed at 14, father unemployed at 14, lived with both parents at 14, father's schooling, mother's schooling, and self-reported height (as a summary measure of early childhood conditions). Previous studies have found these indicators of childhood conditions and height to be strong predictors of cognitive function at both younger and older ages (see, e.g., Case and Paxson 2010, 2011). If we believe that the IV method takes care of the omission of innate ability, then we expect that the IV method should provide an insignificant coefficient of English ability for the ability outcomes. Keeping in mind that these measures are not perfect, we estimated regressions for subjective math skills and found English skills to be insignificant.

English Skills and Health, Social, and Other Outcomes

We examine the impact of English skills on the health aspects of life and report the results in Panel A of Table 6. The results exclude the years of schooling as a control but include the full set of other controls. As before, including years of schooling in the list of controls does not significantly affect the results; hence, the results are not reported here for the sake of brevity. We find that male migrants with better English skills tend to be more risk-loving and are more likely to do exercise and smoke; however, women with better English skills have better health, in line with the better values of women's health indicators (objective and subjective). Overall, the results suggest that women enjoy greater health benefits from having better English skills.

The effects of English skills on social outcomes are also examined, and the results are reported in Panel B of Table 6. The IV estimates suggest a significant effect of English skills on male-dominant gender views, which is more apparent for women. Men who have better English are less likely to report that men make better politicians

Table 5 English skills and labor market outcomes: IV with sibling fixed effects

Variable	ln Hourly Wage (1)	ln Hourly Wage (full-time employed) (2)	ln Hourly Wage (control for tenure) (3)	ln Hourly Wage (main job) (4)	Probability of Losing Job (5)	Promoted (6)
Arrived Young (0–11 years)	0.731†	0.728*	0.745†	0.741†	–8.529	0.0417
	(2.39)	(3.01)	(2.44)	(2.45)	(0.37)	(0.15)
Arrived Young (0–9 years)	0.404	0.407†	0.414	0.410	–12.59	0.0111
	(1.67)	(2.28)	(1.72)	(1.71)	(0.65)	(0.05)
Max. (0, age at arrival – 11)	1.436†	1.422†	1.467†	1.456†	0.341	0.212
	(2.05)	(2.28)	(2.08)	(2.09)	(0.01)	(0.25)
Max. (0, age at arrival – 9)	0.404	0.407†	0.414	0.410	–12.59	0.00985
	(1.67)	(2.28)	(1.72)	(1.71)	(0.65)	(0.04)

Notes: Each regression includes a gender dummy variable, age, an age-at-migration dummy variable, and dummy variables for country-of-birth. Standard errors are clustered at the person and country-of-birth levels, and absolute *t* statistics are shown in parentheses.

†$p < .10$; *$p < .05$

Table 6 IV estimations: Health, social and partner outcomes (coefficient of English ability)

	Full Sample[a]	Full Sample[b]	Male Sample[a]	Female Sample[a]
Panel A: Health Outcomes				
Risk averse (0–1)	–0.273†	–0.278	–0.460†	–0.155
	(2.18)	(1.84)	(2.44)	(0.77)
Smoker (0–1)	0.208	–0.0790	0.475*	0.0219
	(1.24)	(0.32)	(2.65)	(0.10)
Smoking frequency (0–3)	0.503	0.113	1.422*	0.149
	(1.13)	(0.18)	(2.74)	(0.22)
Do exercise (0–1)	0.188†	0.125	0.177†	0.197
	(2.12)	(1.23)	(2.35)	(1.17)
Drink alcohol (0–1)	0.430†	0.212	0.0621	0.614*
	(2.40)	(0.72)	(0.34)	(3.03)
Drinking frequency (0–6)	1.655†	–0.220	0.687	2.106†
	(2.20)	(0.21)	(0.87)	(2.18)
Health satisfaction (0–10)	1.315	0.417	0.0819	1.910†
	(1.90)	(0.61)	(0.08)	(1.97)
Self-assessed health (1–5)	0.835†	0.312	–0.282	1.544**
	(2.16)	(0.62)	(0.33)	(3.45)
Chronic condition (0–1)	–0.276*	–0.0669	–0.193	–0.339*
	(3.07)	(0.48)	(1.67)	(2.81)
SF-36 objective health items				
Overall health (0–100)	16.52	–2.934	–17.35	36.71*
	(1.63)	(0.20)	(0.76)	(3.04)

Table 6 (continued)

	Full Sample[a]	Full Sample[b]	Male Sample[a]	Female Sample[a]
Mental health (0–100)	11.99	6.731	–1.243	19.12†
	(1.50)	(0.58)	(0.10)	(1.98)
Physical functioning (0–100)	19.77**	9.690	0.329	30.24**
	(4.03)	(0.93)	(0.05)	(4.49)
Physical health (0–100)	28.40*	4.405	0.925	42.63*
	(2.83)	(0.26)	(0.06)	(2.67)
Less bodily pain (0–100)	27.05†	15.09	7.716	41.09*
	(2.28)	(0.86)	(0.54)	(2.66)
Social functioning (0–100)	26.20*	17.33	10.39	36.87*
	(3.09)	(1.52)	(0.95)	(2.98)
Emotional health (0–100)	18.95	11.27	–3.458	35.58**
	(1.78)	(0.74)	(0.18)	(3.49)
Panel B: Social Outcomes				
Life satisfaction (0–10)	0.992	1.130	0.0101	1.463
	(1.56)	(1.64)	(0.01)	(1.65)
Satisfaction with how safe your feel (0–10)	1.795*	2.274*	0.580	2.568†
	(3.28)	(3.04)	(0.78)	(2.44)
Age at first marriage	7.280†	10.01*	12.73*	7.199*
	(2.37)	(2.93)	(3.03)	(3.27)
Interpersonal trust (1–7)	0.955	0.280	0.118	1.682†
	(1.91)	(0.44)	(0.21)	(2.14)
Men make better politicians than women (1–7)	–2.387**	–3.033†	–2.062†	–3.499†

Table 6 (continued)

	Full Sample[a]	Full Sample[b]	Male Sample[a]	Female Sample[a]
	(3.46)	(2.01)	(2.48)	(2.27)
Women should stay at home not work (1–7)	–1.656†	–0.356	–0.999	–2.219†
	(2.01)	(0.33)	(1.35)	(1.98)
Is a never-married single parent (0–1)	0.700†	0.631	2.054	0.473
	(2.40)	(1.36)	(1.42)	(1.32)
Panel C: Partner Outcomes	Partnered[a] Sample	Partnered[b] Sample	Married[a] Sample	Married Sample
Spouse's English ability (0–3)	0.671**	0.572*	0.603**	0.499*
	(3.90)	(3.17)	(3.42)	(2.62)
Spouse was born in Australia (0–1)	0.666**	0.557†	0.502*	0.463
	(3.82)	(2.05)	(2.93)	(1.70)
Spouse has the same country of birth (0–1)	–0.782**	–0.658*	–0.695**	–0.605†
	(4.36)	(2.79)	(3.83)	(2.46)
Spouse has the same father ancestry (0–1)	–0.421†	–0.465†	–0.342†	–0.432†
	(2.57)	(2.32)	(2.03)	(1.99)
Spouse has the same mother ancestry (0–1)	–0.441†	–0.529†	–0.336	–0.451
	(2.54)	(2.07)	(1.93)	(1.70)
Spouse's understanding of survey questions (1–5)	0.632**	0.636*	0.532*	0.553†
	(3.60)	(2.99)	(2.97)	(2.53)
Spouse's English affected interview (0–1)	–0.447**	–0.356*	–0.404**	–0.332*
	(4.69)	(2.90)	(4.23)	(2.80)
Spouse is in the labor force (0–1)	0.224	0.375†	0.204	0.369
	(1.63)	(2.09)	(1.38)	(1.86)

Table 6 (continued)

	Full Sample[a]	Full Sample[b]	Male Sample[a]	Female Sample[a]
Spouse drinks (0–1)	0.415*	0.153	0.436*	0.130
	(2.72)	(0.49)	(2.77)	(0.39)
Spouse's drinking frequency (0–1)	2.150†	0.649	1.819†	0.0673
	(2.47)	(0.47)	(2.02)	(0.04)
Spouse's subjective health (0–1)	0.766†	1.036	0.914†	1.358†
	(2.10)	(1.94)	(2.30)	(2.28)
Spouse has chronic sickness (0–1)	–0.173	–0.262	–0.182	–0.304†
	(1.79)	(1.93)	(1.71)	(2.08)
Panel D: Interviewer-Assessed Outcomes				
Understanding of survey questions (1–5)	0.764**	0.791**	0.894**	0.744**
	(6.07)	(4.95)	(4.06)	(7.17)
Following problem affected interview (0–1)	–0.481**	–0.530**	–0.513**	–0.447**
English was second language	(8.08)	(7.75)	(5.36)	(7.01)

Notes: Each regression includes a gender dummy variable, age, dummy variables for age-at-migration, and dummy variables for country of birth. Standard errors, clustered at the person and country-of-birth levels are shown in parentheses.

[a] IV: Arrived young (0–11 years) × NES country of birth.

[b] IV: Arrived young (0–11 years) × migrants whose first language was not English.

†$p < .10$; *$p < .05$; **$p < .01$

than women. They are also less likely to report that women should stay at home instead of working. These results indicate that language ability has beneficial effects on attitudes toward women. Both the age at first marriage and the satisfaction with how safe they feel are higher for people with better English skills. There seems to be a weak effect of English skills on being a never-married single parent. There is not a significant effect of English proficiency on overall life satisfaction.

In panel C of Table 6, we examine the role of English proficiency on partners' outcomes. The results show that migrants with better English skills tend to marry partners who speak better English, are born in Australia, drink (and drink often), and belong to a different country of birth and ancestry. Migrants with better English also have partners who have better health conditions, are more likely to be in the labor force, and do not have problems with the survey because of a lack of English language skills. Overall, the results show that English skills have important causal effects on individuals' partner choice and social life. Last, we find that English skills also predict how well the respondents can understand the questions in the HILDA survey and whether English was a problem for the respondent during the surveys, both of which are assessed by the interviewer directly. This finding also supports the validity of using a self-reported English proficiency variable.

Intergenerational Transmission

Next we examine the influence of parents' English abilities on Australian-born children's life outcomes. In this section, our sample of interest consists of children whose parents migrated with their parents to Australia as children. Thus, the sample size is considerably smaller given that we need third-generation migrants in the sample in order to examine the effects. The OLS estimates reported in Table 7 show a very significant positive relationship between parents' and children's English skills. However, the relationship between a child's English ability and his/her mother's English ability is higher than that between the child's ability and the father's. Table 8 reports the coefficient estimates (first-stage regression) of the relationship between parental English language ability and parental age at arrival. The results also confirm our earlier findings that age at migration is a highly significant predictor of the English ability of Australian-born children's immigrant parents. A higher level of parental English ability is associated with a younger age at arrival.

In Table 9, we examine the causal effect of fathers' and mothers' English skills on their children's outcomes. The results show that the better a father's English skills, the greater the children's English abilities and the better their high school math scores (self-reported). Children whose father's English skills are good place less importance on having kids but place more importance on hobbies and sports. Fathers with better English skills also increase their children's likelihood of living in a rural area and owning/buying a house. Panel B of Table 9 shows that the better a mother's English skills, the greater the children's satisfaction with their relationship with their parents. Children whose mother's English skills are good have higher socialization indexes (i.e., are more social). Mothers with better English skills also increase their children's likelihood of being a member of a club and being a supervisor at a job. We also observe that a lack of proficiency in

Table 7 Intergenerational transmission of English skills (dependent variable: children's English proficiency)

	Full Sample (1)	Full Sample (2)	Years in Australia ≥16 and ≤30 (3)	Full Sample (4)	Full Sample (5)	Years in Australia ≥16 and ≤30 (6)
Father's Age	0.00552*	0.00632†	0.00347			
	(2.58)	(2.20)	(0.87)			
Father's English	0.0819**	0.0656†	0.0716*			
	(4.37)	(2.39)	(3.19)			
Mother's Age				0.00749**	0.00712	0.00376
				(3.87)	(1.79)	(0.67)
Mother's English				0.100**	0.115**	0.106**
				(3.91)	(5.17)	(3.69)
Schooling	0.0119	0.0193	0.00439	0.0185**	0.0200†	0.00637
	(1.95)	(1.63)	(0.52)	(3.68)	(2.05)	(0.68)
Gender (male = 1)	–0.00652	0.0113	0.0155	–0.00925	–0.0110	0.00995
	(0.36)	(0.36)	(0.54)	(0.66)	(0.40)	(0.30)
Age	–0.00900	–0.0106†	–0.00621	–0.0116*	–0.00790	–0.00309
	(1.76)	(2.34)	(0.98)	(3.21)	(1.41)	(0.61)
Age at Arrival		–0.0150**	–0.00820		–0.0120*	–0.00595
		(3.57)	(0.79)		(2.91)	(0.96)
N	1,785	814	266	2,455	1,069	343
Adjusted R^2	.091	.178	.175	.113	.198	.134

Notes: The regressions also include father's age, mother's age, sex, age, and parental age at arrival. Columns 3 and 6 are estimated for immigrants who have been living in Australia for at least 16 years and no more than 30 years. *t* statistics are shown in parentheses.

†$p < .10$; *$p < .05$; **$p < .01$

Table 8 First stage: Parents' age at migration and parents' English skills

	Father Born Overseas		Mother Born Overseas	
English Ability (0–3)	(1)	(2)	(3)	(4)
Arrived Young × NES Country of Birth	0.104**		0.407**	
	(6.62)		(21.42)	
Arrived Young (0–11)	–0.00565		0.00692	
	(0.51)		(0.54)	
Age at Immigration × NES Country of Birth		–0.0120** (8.29)		–0.0289** (17.64)
Country of Birth Dummy Variables	Yes	Yes	Yes	Yes
Age at Immigration Dummy Variables	No	Yes	No	Yes
Age	Yes	Yes	Yes	Yes
N	3,936	3,936	5,116	5,116
Adjusted R^2	.408	.441	.490	.533

Notes: OLS regressions. *t* statistics are shown in parentheses.

**$p < .01$

English is reflected in the length (in minutes) of the HILDA interview and the understanding of the HILDA survey questions (interviewer assessed).

Conclusion

In this article, we examine the causal effects of language proficiency on a range of economic and social indicators, including a number of variables that have not been examined in the literature. We find a significant positive effect of English language skills on wages and promotions among individuals who immigrated to Australia as children. The effect of English language skills is very strong and does not appear to be mediated by years of schooling. English language skills have important health benefits for women. Despite positive effects on wages, English skills do not affect men's health, which is probably attributable to their increased risk-taking and smoking. On the other hand, the respondent's own English proficiency increases the age at first marriage and decreases male-dominant gender views. In addition, a greater proficiency in English increases not only the partner's English but also the probability of marrying a person who is from a different ethnic background or country of origin and who drinks.

Children whose parents have lower levels of proficiency in English have significantly worse English language skills, and poor parental English language skills do appear to have permanent detrimental effects. Such children have worse math performance in high school, lower social capital, and lower levels of occupational prestige at work. Our results indicate that English language skills play an important role in the process of social assimilation. Children whose parents have higher levels of proficiency

Table 9 IV estimates: Parents' English skills and Australian-born children's outcomes

Children Outcomes	Coefficient on Father's English Ability	Observations
Panel A		
English skills	1.321**	137
	(13.86)	
Math performance during high school	3.268†	54
	(2.55)	
Urban residence	–1.256**	3,106
	(4.07)	
House ownership or buying	–0.911**	2,801
	(3.60)	
Importance of sports and hobbies now	5.239†	54
	(1.97)	
Importance of having kids at 35	–3.732*	54
	(3.15)	
Panel B		
Club membership	0.363†	1,148
	(2.00)	
Socialization index	1.069†	1,119
	(2.16)	
Supervisor at job	0.956†	867
	(2.22)	
Length of interview	–4.577**	3,301
	(3.61)	
Understanding of survey questions	0.815†	1,325
	(2.25)	
Satisfaction with relationship with parents	2.359†	377
	(2.02)	

Notes: Table shows IV regressions which include father's age, mother's age, sex, age, and parental age at arrival. The sample is of Australia-born children whose parents have been living in Australia for at least 16 years but no more than 30 years, and came before the age of 18. *t* statistics are shown in parentheses.

† $p < .10$; * $p < .05$; ** $p < .01$

in English place significantly more importance on enjoyment and less on having children in later years.

These results suggest that immigrants' English proficiency and integration do not depend fully on outcomes related to their country of origin but instead also depend on predetermined barriers. Our findings suggest that the timing of migration and its effect on English language skills are critical to a range of important policy-relevant outcomes. If the age at arrival is so critical for immigrants' integration, this could be taken into account via a points system for those with children. A system that favors migration when one's children are younger might improve the welfare of potential first- and second-generation immigrants.

Acknowledgments We thank Alicia Adsera, Claudia Senik, Steven Stillman, Hee-Seung Yang, Paul Miller, Amee Chin, Chau Nguyen, Abdurrahman Aydemir, Deborah Ann-Cobb Clark, and participants at the HILDA conference in 2013 and at the University of Melbourne-Princeton University Workshop on International Perspectives on Immigration, as well as seminar participants at Flinders University, Monash University, and Bilkent University for comments and suggestions on earlier drafts. Any remaining errors are our own. Islam gratefully acknowledges funding support from the Australian Research Council (DE120101588).

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